

## REMARKS

In response to the Office Action dated January 29, 2010, Applicants respectfully request reconsideration based on the above claim amendments and the following remarks. Applicants respectfully submit that the claims as presented are in condition for allowance.

Claims 1-14 and 23-29 are pending in the present Application. Claims 1, 10 and 23 are amended, leaving Claims 1-14 and 23-29 for consideration upon entry of the present amendments and following remarks.

Support for the claim amendments can at least be found in the specification, the figures, and the claims as originally filed. Particularly, support for amended independent Claims 1, 10 and 23 is at least found in originally filed Figures 3 and 4.

No new matter has been introduced by these amendments. Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

### Claim Rejections Under 35 U.S.C. §103

Claims 1-9, 10-14 and 23-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim, et al., International Publication WO 01/45283 A1 (hereinafter "Kim") in view of Kikkawa et al., U.S. Patent No. 6,879,359 (hereinafter "Kikkawa") and . Applicants respectfully traverse the rejections for the reasons set forth below.

Amended independent **Claims 1, 10 and 23** similarly recite, *inter alia*:

*"a first substrate including a transparent substrate, a plurality of unit cells and a first transparent electrode, each of the unit cells having i) a sensor thin film transistor for receiving a light reflected from a fingerprint to generate electric charges corresponding to an intensity of the reflected light, ii) a storage device for storing the electric charges, iii) a first switch thin film transistor for receiving the electric charges from the storage device to output the electric charges in response to an external control signal,*  
*wherein*

*the transparent substrate includes an upper surface, a lower surface facing the upper surface, and sidewalls connecting the upper and lower surfaces; and*  
*the first transparent electrode is disposed on the lower surface, the first transparent electrode makes contact with the lower surface, and the unit cells make contact with the upper surface, and*

*a liquid crystal layer interposed between the first and second substrates, wherein the liquid crystal layer contacts the first transparent electrode contacting the lower surface."*

In a non-limiting embodiment of the claimed invention, with reference to Figures 3 and 4 (reproduced below), where the first transparent electrode (450) contacts the lower surface of the transparent substrate (412) of the first substrate (400), and the unit cells (410a/410b/436/438) make contact with the upper surface of the transparent substrate (412) of the first substrate (400), the invention includes the first transparent electrode and the unit cells disposed on a *same substrate*.

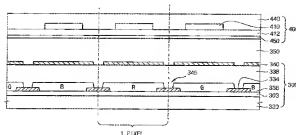


FIG. 3

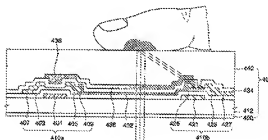
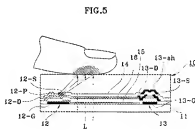


FIG. 4

Regarding **Kim** in the instant Office action at Pages 2 and 3, transparent substrate 11, sensor TFT 12, first electrode 14/second electrode 15/insulating layer 16, and switching TFT 13 in Figures 4-6 of Kim (Figures 4 and 5 reproduced below) are respectively considered as teaching the “first substrate,” the “sensor TFT,” the “storage device” and the “first switch TFT” of the claimed invention.

Kim teaches with respect to Figure 5 (reproduced below) a fingerprint reader 10 includes the sensor TFT 12, the switching TFT 13, the first electrode 14, the second electrode 15 and the insulating layer 16. (See, page 4, lines 19-26 of Kim.) For purposes of this response, the transparent substrate 11 of the fingerprint reader 10 of Kim may be considered as teaching *“a transparent substrate including an upper surface, a lower surface facing the upper surface, and sidewalls connecting the upper and lower surfaces”* of the “first substrate” of the claimed invention.



Where the transparent substrate 11 of Kim is the “transparent substrate” of the claimed invention, Kim *does not teach or suggest* **a first transparent electrode disposed on the lower surface of the transparent substrate 11, the first transparent electrode makes contact with the**

**lower surface, the sensor TFT 12/first electrode 14/second electrode 15/insulating layer 16/switching TFT 13 (as "unit cell") contact the upper surface of the transparent substrate 11, and the liquid crystal layer contacts the first transparent electrode contacting the lower surface of the transparent substrate 11** of amended independent Claims 1, 10 and 23.

It is conceded in the instant Office action that Kim does not explicitly teach the LCD display 3 having a *first transparent electrode*, a second substrate having a second transparent electrode, a color filter and a second switch TFT, wherein *the first transparent electrode is in contact with the lower surface of the first substrate and the liquid crystal layer contacts the first transparent electrode*.

Regarding **Kikkawa** in the instant Office action at Page 3, Figure 3 of Kikkawa is relied upon as teaching an LCD. Referring to the LCD in Figure 3 (reproduced below) of Kikkawa, *opposite electrode 34*, substrate 21, pixel electrode 31, color filter 30 and gate 22/source 26/drain 27 are respectively considered as teaching the "*first transparent electrode*," the "*second substrate*," the "*second transparent electrode*," the "*color filter*" and the "*second switch TFT*" of the claimed invention. A alignment layer 36 is disposed on the opposite electrode 34 between second substrate 35 and *liquid crystal layer 33*.

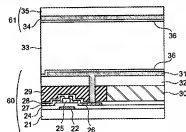
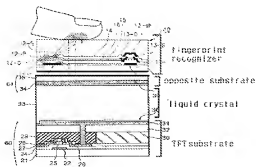


Fig.3

Regarding independent Claims 1, 10 and 23 in the instant Office action at Page 3, it is asserted that it would have been obvious to one skilled in the art at the time of the invention was made to combine the Kikkawa LCD panel into the Kim fingerprint terminal in order to obtain an LCD device having both a data display function and a fingerprint capture function.

A combined structure of the LCD panel of Kikkawa and the fingerprint terminal of Kim teaches and suggests a device including three substrates, e.g., transparent substrate 11 of the fingerprint reader 10 of Kim, and first/second substrate 21/35 of Kikkawa.



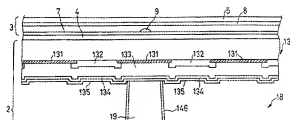
More specifically, where the transparent substrate 11 of Kim is the "transparent substrate" of

the claimed invention, opposite electrode 34 (as the “first transparent electrode”) of Kikkawa of the combined structure *does not teach or suggest* **the opposite 34 electrode makes contact with the lower surface of the transparent substrate 11, the sensor TFT 12/first electrode 14/second electrode 15/insulating layer 16/switching TFT 13 (as “unit cell”) contact the upper surface of the transparent substrate 11, and the liquid crystal layer 33 contacts the opposite electrode 34 contacting the lower surface of the transparent substrate 11** of amended independent Claims 1, 10 and 23. To the contrary, the second substrate 35 of Kikkawa is disposed between the opposite electrode 34 (as the “first transparent electrode”) and the transparent substrate 11 (as the “transparent substrate”), in addition to at least the alignment layer 36 being between the opposite electrode 34 and the liquid crystal layer 33, contrary to the claimed invention.

Regarding **Kurihara** in the instant Office action at Page 3, Figure 2 of Kurihara is relied upon as teaching a first electrode can be formed on a lower substrate of a first substrate. It is then concluded that it would have been obvious to modify the transparent substrate 11 of the fingerprint reader 10 taught by Kim, to have an electrode at a lower surface of a first substrate as taught by Kurihara, in order to obtain a portable device and a weight reduction (See, Abstract).

Referring to the display in Figure 2 (portion reproduced below) of Kurihara, common electrode 134 and color filter substrate 13 are respectively considered as teaching the “first transparent electrode” and the “first substrate” of the claimed invention.

Kurihara teaches liquid crystal layer 18 is sealed in a space between the color filter substrate 13 and an array substrate 14. (See, Col. 7, lines 14-17 of Kurihara.) On the color filter substrate 13, an orientation film 135 is formed on one side of the common electrode 134 while protective film 133 is formed on the opposing side of the common electrode 134. (See, Col. 8, lines 6-8 and 12-14 of Kurihara.) That is, Kurihara merely teaches the common electrode 134 disposed on a lower portion or substrate of the color filter substrate 13, with elements disposed directly on either side of the common electrode 134, none of the elements being a substrate or a liquid crystal layer.



Since Kurihara specifically teaches elements disposed directly on either side of the common electrode 134, where none of the elements are a substrate or a liquid crystal layer, if the  
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transparent substrate 11 of Kim were modified to include the common electrode 134 taught by Kurihara, the resulting common electrode 134 would not be disposed contacting the transparent substrate 11. That is, there would be an intervening element on a side of the common electrode 134 which necessarily prevents the common electrode 134 from touching the transparent substrate 11 of Kim in the combined structure.

Therefore, even combining Kim and Kurihara *does not teach or suggest* **the common electrode 134 makes contact with the lower surface of the transparent substrate 11, the sensor TFT 12/first electrode 14/second electrode 15/insulating layer 16/switching TFT 13 (as "unit cell") contact the upper surface of the transparent substrate 11, of amended independent Claims 1, 10 and 23.** To the contrary, an element such as the protective film 133 would be disposed between the common electrode 134 (as the "first transparent electrode") and the transparent substrate 11, such that the common electrode 134 would not contact the transparent substrate 11.

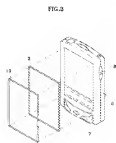
Furthermore, even if the Kikkawa LCD panel were combined into the Kim fingerprint terminal 10, and the transparent substrate 11 of the fingerprint terminal 10 of Kim were modified to include the common electrode 134 taught by Kurihara, since Kikkawa teaches at least the second substrate 35 and the alignment layer 36 between the fingerprint reader 10 of Kim and the liquid crystal layer 33 of Kikkawa, the resulting common electrode 134 from Kurihara in the fingerprint terminal 10 of Kim would not be disposed contacting liquid crystal layer 33 of the LCD of Kikkawa.

Since Kikkawa teaches at least the second substrate 35 and the alignment layer 36 between the fingerprint reader 10 of Kim and the liquid crystal layer 33 of Kikkawa, even combining Kim, Kikkawa and Kurihara *does not teach or suggest* **the liquid crystal layer 33 contacts the common electrode 134 contacting the lower surface of the transparent substrate 11** of amended independent Claims 1 and 23. To the contrary, an element such as the second substrate 35 and/or the alignment layer 36 would be disposed between the common electrode 134 (as the "first transparent electrode") and the liquid crystal layer 33.

In making a Section 103 rejection, the Examiner bears the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1998). The Examiner "... can satisfy this burden only by showing some objective teaching in the prior art or that

knowledge generally available to one of ordinary skill in art would lead that individual to combine the relevant teachings of the references". Id.

Firstly, for example, referring to Figure 3 (reproduced below) of Kim, Kim specifically discloses the fingerprint reader 10 and the LCD 3 as *separate elements* from each other. Since the fingerprint reader 10 and the LCD panel 3 of Kim are *separate from each other*, and since the fingerprint reader 10 of Kim includes one substrate (11), and since the device of Kikkawa (substituted for the LCD panel of Kim) includes two substrate 60 and 61, as discussed above, there would be a total of three substrates in the resulting combined structure of at least Kim and Kikkawa. More specifically, as discussed above, a transparent electrode from the LCD panel would not contact the "transparent substrate" of the fingerprint reader 10, and the liquid crystal layer of the LCD panel would not contact the transparent electrode.



Problems associated with this three-substrate structure are described in the specification at page 2, line 18 to page 4, line 7 with reference to Figure 2 of the claimed invention. However, since the claimed invention integrates the sensor for sensing the fingerprint into the first substrate of the device, the total number of substrates is advantageously reduced to two, thereby simplifying the device.

That is, based on the *objective teachings of the references*, one of ordinary skill would not be led to combine at least Kim and Kikkawa to teach the first transparent electrode makes contact with the lower surface of the transparent substrate, the unit cells make contact with the upper surface of the transparent substrate, and a liquid crystal layer contacts the first transparent electrode disposed contacting the lower surface of the transparent substrate of amended independent Claims 1, 10 and 23.

Secondly, in the instant Office action at Page 3, it is concluded that it would have been obvious to modify the transparent substrate 11 of the fingerprint reader 10 taught by Kim, to have an electrode at a lower surface of a first substrate as taught by Kurihara, in order to obtain a portable device *and a weight reduction*, as allegedly evidenced by the Abstract of Kurihara.

Applicants understand this statement to be asserting that the "obtaining a weight reduction" is a  
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teaching, suggestion or motivation that would lead that individual to combine the relevant teachings of the references. Applicants respectfully disagree.

In the Abstract, Kurihara teaches a touch sensor type liquid crystal display which can endure long-time use while *achieving a weight reduction*. One problem associated with weight reduction has been the use of a glass substrate, which forms a touch sensor panel. (See, Col. 2, lines 3-7 of Kurihara.) Kurihara teaches that even if a touch sensor panel includes one moveable electrode plate of a plastic film, a sufficient reduction in weight cannot be made because the other electrode plate is made of glass. (See, Col. 2, lines 12-15 of Kurihara.) Kurihara teaches that where both electrode plates are plastic films, there is a problem that the display cannot endure long use time. (See, Col. 2, lines 20-32 of Kurihara.) To achieve a satisfactory weight reduction, Kurihara uses a type of display which does not use a glass substrate for a sensor panel, and instead uses improved spacers. (See, Col. 2, lines 48-54 of Kurihara.)

That is, the “weight reduction” asserted as a teaching, suggestion or motivation that would lead that individual to combine the relevant teachings of Kim, Kikkawa and Kurihara specifically focuses on the elimination of glass plates, and the use of spacers. This “weight reduction” taught by Kurihara has nothing to do with forming an electrode at a lower surface of a transparent substrate of the claimed invention.

Therefore, the “weight reduction” relied upon in the instant Office action, *does not provide a suggestion or motivation* to modify or combine Kim, Kikkawa and Kurihara to teach the first transparent electrode makes contact with the lower surface of the transparent substrate, the unit cells make contact with the upper surface of the transparent substrate, and a liquid crystal layer contacts the first transparent electrode disposed contacting the lower surface of the transparent substrate of amended independent Claims 1, 10 and 23.

Thirdly, to achieve a portable device *and a weight reduction*, to teach the claimed invention, as allegedly evidenced by the Abstract of Kurihara, one would have to first combine the fingerprint panel 10 of Kim and the LCD of Kikkawa, then *omit* one the transparent substrate 11 of the fingerprint reader 10 of Kim or the second substrate 34 of the LCD of Kikkawa so that the opposite electrode 34 contacts the remaining “transparent substrate,” as claimed. Secondly, one would have to further *omit* at least the protective film 133 and elements 131/132 of Kurihara so that the common electrode 134 of Kurihara contacts the remaining “transparent substrate,” as

claimed. Thirdly, one would have to further *omit* at least the orientation film 135 of Kurihara so that the common electrode 134 of Kurihara contacts the liquid crystal layer 18.

Kim, Kikkawa and Kurihara are related to liquid crystal displays (LCDs). Applicants respectfully submit that no citation to a reference, demonstrating a standard in liquid crystal displays, especially in the reduction of a size/weight or making a portable/compact display, has been offered in the instant office action to support the Examiner's assertion that to achieve a portable device *and a weight reduction*, two separate substrates of two separate devices specifically taught by two separate references are somehow combined into one, then various elements are omitted to provide contact between a transparent electrode, a transparent substrate and a liquid crystal layer, so that **the first transparent electrode makes contact with the lower surface of the transparent substrate, the unit cells make contact with the upper surface of the transparent substrate, and a liquid crystal layer contacts the first transparent electrode disposed contacting the lower surface of the transparent substrate** of amended independent Claims 1, 10 and 23.

As discussed above, more than a mere combination of Kim, Kikkawa and Kurihara, and more specifically a modification of making substrate 11 of Kim and substrate 35 of Kikkawa into one element and then omitting other elements, is required to allegedly teach the claimed invention. Since Kim, Kikkawa and Kurihara pertain to liquid crystal displays, Applicants respectfully submit that these cited references do not establish a standard in liquid crystal displays, particularly in achieve a portable device *and a weight reduction* by making substrate 11 of Kim and substrate 35 of Kikkawa into one element and then omitting other elements.

Therefore, there further exists *no suggestion or motivation*, provided by the references or one skilled in the art, to modify or combine Kim, Kikkawa and Kurihara to teach **the first transparent electrode makes contact with the lower surface of the transparent substrate, the unit cells make contact with the upper surface of the transparent substrate, and a liquid crystal layer contacts the first transparent electrode disposed contacting the lower surface of the transparent substrate** of amended independent Claims 1, 10 and 23.

Fourthly, Kim and Kikkawa relate to the pertinent art and do not teach or suggest, and in fact are silent to ways or methods of reducing a size/weight of the LCD structures. As discussed above, Kurihara specifically teaches reducing a weight by the elimination of glass plates, and the



use of spacers. Since neither Kim, Kikkawa nor Kurihara teaches obtaining a reduction of a size/weight or making a portable/compact display by combining/omitting substrates and further omitting other elements, Applicant respectfully submits that such combining/omitting substrates and further omitting other elements is not of *instant and unquestionable* demonstration as being well known. (MPEP 2144.03(A.)) Therefore, Applicants respectfully submit that it is not well known in the art of liquid crystal displays that to reduce of a size/weight or make a portable/compact display, separately taught substrates are combined and separately taught elements are further omitted.

Therefore, there further exists *no suggestion or motivation*, provided by the references or one skilled in the art, to modify or combine Kim, Kikkawa and Kurihara to teach **the first transparent electrode makes contact with the lower surface of the transparent substrate, the unit cells make contact with the upper surface of the transparent substrate, and a liquid crystal layer contacts the first transparent electrode disposed contacting the lower surface of the transparent substrate** of amended independent Claims 1, 10 and 23.

Finally, Applicants respectfully submit that the Examiner has used an improper standard in arriving at the rejection of the above claims under section 103, based on improper hindsight, which fails to consider the totality of Applicant's invention and to the totality of the cited references, Kim, Kikkawa and Kurihara. More specifically the Examiner has used Applicant's disclosure to select portions of the cited references to allegedly arrive at Applicant's invention. In doing so, the Examiner has failed to consider the teachings of the references or Applicant's invention as a whole in contravention of section 103.

In applying Section 103, the U.S. Court of Appeals for the Federal Circuit has consistently held that one must consider both the invention and the prior art "as a whole", not from improper hindsight gained from consideration of the claimed invention. See, *Interconnect Planning Corp. v. Feil*, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985) and cases cited therein. According to the *Interconnect* court :

"[n]ot only must the claimed invention as a whole be evaluated, but so also must the references as a whole, so that their teachings are applied in the context of their significance to a technician at the time - a technician without our knowledge of the solution. "

*Id.* Also critical to this Section 103 analysis is that understanding of “particular results” achieved by the invention. *Id.*

When, as here, the Section 103 rejection was based on selective combination of the prior art references to allegedly render a subsequent invention obvious, “there must be some reason for the combination other than the hind sight gleaned from the invention itself.” *Id.* Stated in another way, “[i]t is impermissible to use the claimed invention as an instruction manual or ‘template’ to piece together the teachings of the prior art so that the claimed invention is rendered obvious.” *In re Fritch* 23 U.S.P.Q.2d 1780, 1784 (Fed. Cir. 1992).

Considering the teaching of Kim, Kikkawa and Kurihara, since the fingerprint reader 10 and the LCD panel 3 of Kim are *separate from each other*, and since the fingerprint reader 10 of Kim includes one substrate (11), and since the device of Kikkawa (substituted for the LCD panel of Kim) includes two substrate 60 and 61, as discussed above, there would be a total of three substrates in the resulting combined structure of at least Kim and Kikkawa. Where the resulting structure is further combined with Kurihara, as discussed above, a transparent electrode from Kurihara would not contact the “transparent substrate” of the resulting structure, and the liquid crystal layer of the LCD panel of Kikkawa or Kurihara would not contact the “transparent electrode” of the resulting structure. That is, the teachings of Kim, Kikkawa and Kurihara do not teach or suggest the claimed invention.

Since a modification of making substrate 11 of Kim and substrate 35 of Kikkawa into one element and then omitting other elements of Kikkawa and Kurihara, is required to teach the claimed invention, Applicants submit that the claimed invention has been used as an instruction manual or ‘template’ to piece together the teachings of Kim, Kikkawa and Kurihara, then to further modify the particular results outside of the teaching of Kim, Kikkawa and Kurihara and knowledge available to one of ordinary skill in the art, so that the claimed invention is rendered obvious. Therefore, the Examiner has used an improper standard in arriving at the rejection of the above claims under section 103, based on improper hindsight, which fails to consider the totality of Applicant’s invention and to the totality of the cited references, Kim, Kikkawa and Kurihara, and thus the rejection over Kim, Kikkawa and Kurihara is improper and should be withdrawn.

Thus, since Kim, Kikkawa and Kurihara, alone or in combination, *fail to teach or suggest all of the limitations of* at least amended independent Claims 1, 10 and 23, since the combination of the *objective teachings* of Kim, Kikkawa and Kurihara would not teach the claimed invention, since no citation to a reference demonstrating a standard in liquid crystal displays, especially in the reduction of a size or making a compact display involving combining separate substrates has been offered in the instant office action, since Kim, Kikkawa and Kurihara relate to the pertinent art and do not teach or suggest and in fact are silent to ways or methods of reducing a size of the LCD structures involving combining substrates so as to demonstrate a standard or what is capable of *instant and unquestionable* demonstration as being well known, since to achieve the claimed invention would involve more than *mere combining* of the references, since the claimed invention has been used as an instruction manual or 'template' to piece together the teachings of Kim, Kikkawa and Kurihara, then to further modify the particular results outside of the teaching of Kim, Kikkawa and Kurihara and knowledge of one of ordinary skill in the art to teach the claimed invention, and since the Examiner has used an improper standard in arriving at the rejection of the above claims under section 103, based on improper hindsight, which fails to consider the totality of Applicant's invention and to the totality of the cited references, *prima facie* obviousness does not exist regarding at least amended independent Claims 1, 10 and 23 with respect to Kim, Kikkawa and Kurihara.

Applicants respectfully submit that independent Claims 1, 10 and 23 are not further rejected or objected and are therefore allowable. As Claims 2-9, 11-14 and 24-29 variously depend from Claims 1, 10 and 23, they are correspondingly allowable. Entry of the claim amendments, reconsideration, withdrawal of the relevant §103 rejections, and allowance of Claims 1-14 and 23-29 are respectfully requested.

### **Conclusion**

In view of the foregoing, it is respectfully submitted that the instant application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance issued. If the Examiner believes that a telephone conference with Applicants' attorneys would be advantageous to the disposition of this case, the Examiner is cordially requested to telephone the undersigned.

Applicants hereby petition for any necessary extension of time required under 37 C.F.R. 1.136(a) or 1.136(b) which may be required for entry and consideration of the present Reply.

In the event the Commissioner of Patents and Trademarks deems additional fees to be due in connection with this application, Applicants' attorney hereby authorizes that such fee be charged to Deposit Account No. 06-1130.

Respectfully submitted,

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